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New species of *Leptothorax* (Hymenoptera: Formicidae) from Cuba

Nuevas especies de Leptothorax *(Hymenoptera: Formicidae) de Cuba*

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Abstract

Five new species of *Leptothorax* from Cuba are described: *L.abeli*, from Sierra Maestra, Santiago de Cuba Province, arboreal habits and relationed to *L. darlingtoni* y *L. splendens; L. banao,* from Sancti Spiritus Heigths, Sancti Spiritus Province; limestone dweller species and relationed to *L. myersi* and *L. villarensis*; *L. cuyaguateje*, from Northern Serpentinous Heigths, Pinar del Rio Province, terricolous habits with no defined relationships; *L. imias,* from Imias, Santiago de Cuba Province, terricolous habits with no defined relationships, and *L. nipensis*, from Nipe-Sagua-Baracoa Massiff, limestone dweller species, relationed to *L. mortoni* and *L. porphyritis*.

Resumen

Se describen cinco especies nuevas de *Leptothorax* de Cuba, *L. abeli*, de la Sierra Maestra, Provincia de Santiago de Cuba, de habitos arboricolas y relacionada con *L. darlingtoni* y *L. splendens*; *L. banao*, de las alturas de Sancti Spiritus, de formaciones cársicas, relacionada con *L. myersi* y *L. villarensis*; *L. cuyaguateje*, de las alturas pizarrosas del Norte, Provincia de Pinar del Río, de hábitos terrícolas y sin afinidades precisas; *L. imias*; de Imías, Provincia de Santiago de Cuba, de hábitos terrícolas y sin afinidades precisas, y *L. nipensis*, de las alturas de Nipe-Sagua-Baracoa, Provincia de Holguín, de formaciones cársicas relacionada con *L. mortoni* y *L. porphyritis*.

Key words: *Leptothorax*, new species, Formicidae, Cuba.

Palabras clave: *Leptothorax*, especies nuevas, Formicidae, Cuba.

INTRODUCTION

Leptotoracine are the most remarkable group of Cuban ants, because its diversity (more than 30 described species), endemicity (only three species are not exclusive of Cuba), and the heterogeneus arrangement of morphological and ecological features, as a consequence of the evolutionary radiation that the group has developed mostly in Cuba territory. BARONI-URBANI (1978) revised the Caribbean segment of the genus *Leptothorax*, formerly considered as Macromischa, and described several new species, including Cuban. He also defined 12 morphological species groups. Later, SNELLING (1986) and FONTENLA (1997) synonymized some of the species previously recognized in Baroni Urbani's revision. I am currently undertaking a phylogenetic analysis of the Antillean *Leptothorax*. As a result, some of the Baroni-Urbani's morphological species groups will change in definition and composition. Because of this reason, the species described in this paper won't be formally included in none of those groups.

All of the specimens are deposited at the Museo Nacional de Historia Natural de Cuba.

Measurements and indices.

Morphological terminology in the text follows BOLTON (1994).

Measurements (mm). Scape length (SL), head width (HW), mesosoma length (ML), petiole length (PL), petiole heigth (PH), postpetiole width (PPW), postpetiole length (PPL). Both of the postpetiole measures in dorsal view. Posterior femur length (FL). Indices. Scape index (SI). SL/HL X100; cephalix index (CI): HW/HL X100; petiole index (PI): PL/MLX100; petiole heigth index (HI): PH/PLX100. Postpetiole index (PPI): PPW/PPLX1100; femur index (FI): FL/MLX100.

SYSTEMATIC

Leptothorax abeli new species
(Fig. 1)

Measurements. Workers (paratypes) SL: 1,12 (1,12-1,2), HW: 1,2 (1,1-1,2), HL: 1,4 (1,4-1,42), ML: 2,1 (1,9-2,1), PL: 0,78 (0,70-0,78), PH: 0,55 (0,52-0,55), PPW: 0,6 (0,6-0,53), PPL: 0,37 (0,37-0,40), FL: 1,55 (1,150-1,55). Indices. SI: 80,3 (80,3-85,7), CI: 82,1 (73,8-82,1), PI: 36,9 (33,3-36,9), HI: 70,9 (70,9-75), PPI: 160 (131-160), FI: 73,8 (73,8-79,4).

Material examined. Holotype: worker, collected by Abel Pérez on May 20, 1995, in Subida a la Nigua, Sierra Maestra, Santiago de Cuba Province. Paratypes: 8 workers, same data as holotype; 4 workers, collected by A. G. Debras, on July 25, in Rio Peladeros, Sierra Maestra, Santiago de Cuba Province.

Diagnosis and comparison. Arboreal species of Cuban *Leptothorax* with a very distinctive pattern of policromous coloration and heavy mesosoma rugae, except in the anterior dorsal part of pronotum. Short propodeal spines present, tibiae and femora swollen with very small tubercles. Petiolar node scale-shaped and postpetiole broader than long. This species is relationed to *L. darlintoni* (Wheeler) and *L. splendens* (Mann). It differs from both of them by lacking the heavy rugae in the anterior part of pronotum in dorsal view. It is more similar to *L. splendens* in general size and body proportions, but differs in the more vivid color pattern, broader petiolar node and smoother head. Both species have not overlapping distribution (*L. abeli* in Western Sierra Maestra, *L. splendens* in the Nipe-Sagua-Baracoa Masiff).

Description. Mandibles five toothed, slighted striated. Antennae with 12 segments, club well differentiated and three-segmented; funiculum segments rounded and stout; scapes short and stout, no surpassing the cephalic length. Head subquadrated. Mesosoma massive, curved in profile, almost evenly broad in dorsal view, throughout. Humeral angles rounded. Promesonotal depression not very conspicuous. Propodeal spines short (16,6% mesosoma length) and stout but sharp at the tips, slightly curved outward in the middle and divergent at the tips; propodeum with a gently declive. Petiolar peduncle short, with 36,9% of mesosoma length, petiolar node scale-shaped and high (54,8% of petiole length). Postpetiole broader than longer. Gaster with a well developed sting. Femora and

tibiae swollen and with small scattered tubercles; femora do not surpass mesosoma length. Tegument shining throughout. Head surface polished, with only feeble striae on the fron and surrounded the eyes. Mesosoma with thick sulcae, transverse at the dorsum and diagonal on the pleurae. Dorsal anterior part of pronotum lacks the sulcae, surface smooth, only with very faint longitudinal striae. Body pilosity composed by long and white acuminate hairs, mostly erected, abundant, but not densely packed. Colour of head, anntenae, legs, petiole, postpetiole and gaster shining brown. Smooth part of pronotum with violaceus reflections. Rest of mesosma darker brown with conspicuous greenish reflections. Coxae yellowish brown.

Distribution. Apparently distributed by the western part of the Sierra Maestra.

Etimology. Named after Abel Pérez, a Cuban arachnologist and first collector of the species.

Comments. The speciments were observed in relatively high numbers, running on tree trunks and branches. Catched specimens reacted in agressive way, stinging painfully.

Leptothorax banao new species
(Fig. 2)

Measurements Workers (paratypes). SL: 1.62 (1.56-1.62), HW: 0.99 (0.93-0.96), HL: 1.23 (1.20-1.23), ML: 1.83 (1.80-1.83), PL: 1.2 (1.1-1.2), PH: 0.33 (0.30-0.33), PPW: 0.39 (0.36-0.39), PPL: 0.42 (0.39-0.42), FL: 1.86 (1.83-1.86). Indices. SI: 131.7 (130-131.7), CI: 80.5 (78.0-80.5), PI: 65.6 (60.1-65.6), HI: 27.5 (27.2-27.5), PPI: 92.8 (92.3-92.8), FI: 101.8 (101.6-101.8).

Material examined. Holotype: worker, collected by Abel Pérez on May, 1994, in Banao, Sancti Sprititus Heigths, Sancti Spiritus Province. Paratypes: 4 workers, same data as holotype.

Diagnosis and comparison. Limestone-dweller species of Cuban *Leptothorax*, with a long and slender body and elongated scapes, legs, petiole and propodeal spines, petiolar node low and rounded, postpetiole longer than broad. Color reddish brown, gaster brown, small and shining. This species is relationed to *L. villarensis* and *L. myersi*. It is more similar to *L. villarensis*, with similar low petiolar nodes, but it differs in minor size, remarkable more slender constitution and lower petiolar node. Besides, coloration is deeper, pilosity more scarce, and longitudinal striation pattern of dorsum of mesosoma is more homogeneus. In addition, it differs from *L. myersi* in the low petiolar node, which is very high and almost scale shape in this last species. *L. banao*, so far it is known, lives in geographic isolation in the Sancti Spiritus Heigths, separated by the *Agabama* basin from the distributional range of the other species, which are sympatric in the Trinidad Heigths and some surrounded lowlands.

Description. Mandibles five toothed. Funiculum with 11 segments. Antennal club four-segmented, but little differentiated; scapes very long and slender, surpassing cephalic length. Eyes relatively small. General constitution of the body slender, mesosoma with longitudinal profile; promesotoraxic depression pronounced; propodeal spines very

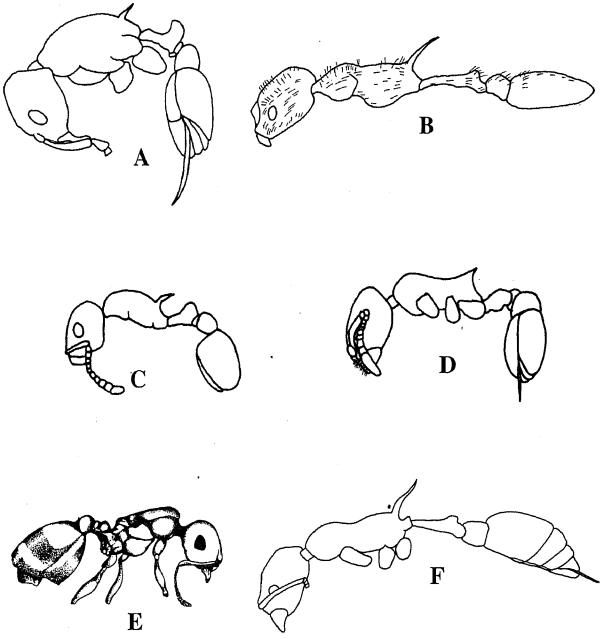

Fig. 1. A, *Leptothorax abeli* new sp. 625X (tegumentary sculpture and most of pilosity no depicted). B, *Leptothorax banao* new sp. 625X (tegumentary sculpture and most of pilosity no depicted). C, *Leptothorax cuyaguateje* new sp. 625X (tegumentary sculpture and most of pilosity no depicted). D, *Leptothorax imias* new sp. 625X (tegumentary sculpture no depicted). E, *Leptothorax imias* female. 312.5X (tegumentary sculpture no depicted). F, *Leptothorax nipensis* new sp. 625X (tegumentary sculpture and most of pilosity no depicted).

Fig. 1. *A,* Leptothorax abeli *esp. nov. 625X (esculturación y mayor parte de la pilosidad no reflejada). B,* Leptothorax banao *esp. nov. 625X (esculturación y mayor parte de la pilosidad no reflejada). C,* Leptothorax cuyaguateje, *esp. nov. 625X (esculturación y mayor parte de la pilosidad no reflejada). D,* Leptothorax imias *esp. nov. 625X (esculturación no reflejada). E,* Leptothorax imias *hembra. 312.5X (esculturación no reflejada). F,* Leptothorax nipensis *esp. nov. 625X (esculturación y mayor parte de la pilosidad no reflejada).*

long (almost 40% of mesosoma length) and sharp, divergent basally, curved outward in th middle and convergent at the tips. Petiole very long and slender (more than 60% of me sosoma length), node very low and rounded, with no defined faces; postpetiole bell-sha ped, longer than broad. Gaster proportionally small, sting well developed. Femora long surpassing mesosoma length; mediall portion not abruptly swollen; tibiae normal. Tegu ment shining in the gaster; head surface with longitudinal narrow striae; mesosoma si- des and dorsum of pronotum with longitudinal ruguae; rest of mesosoma dorsum with transverse rugae. Petiole striated; postpetiole slightly striated. Pilosity abundant, except in petiole and postpetiole, composed by long white acuminate hairs. Colour reddish; anten- nae and legs brown; gaster black.

Distribution. Sancti Spiritus Heigths, Sancti Spiritus Province.

Etimology. Named after the type locality.

Comments. The specimens were collected on limestone rocks in a forest habitat. It is assumed this species is a limestone-nesting, not only because the habitat, but also be- cause the high resemblance to *L. myersi* and *L. villarensis*, which built the typical tubular cartoon-like entrance to the nest, located in limestone rocks crevices. Also the specimens displayed the characteristic slow movements of this kind of species.

Leptothorax cuyaguateje new species
(Fig. 3)

Measurements. Workers (paratypes) SL: 0.66 (0.64-0.66), HW: 0.54 (0.52-0.54), HL: 0.72 (0.68-0.72), ML: 0.81 (0.79-0.81), PL: 0.33 (0.30-0.33), PH: 0.27 (0.25-0.27), PPW: 0.39 (0.37-0.39), PPL: 0.30 (0.25-0.30), FL: 0.57 (0.55-0.57). Indices. SI: 91.7 (91.7-94.1), CI: 75.0 (75.0-76.5), PI: 40.7 (37.9-40.7), HI: 81.8 (81.8-83.3), PPI: 130.0 (130.0-148.0), FI: 70.4 (69.6-70.4).

Material examined. Holotype, worker, from Ceja de Francisco, Northern Serpentinous Heighs, Pinar del Rio Province, collected by J. L. Fontenla in March, 1993. Paratypes; three wor- kers, same data as holotype.

Diagnosis and comparison. Terricolous species of Cuban *Leptothorax* with small size, massive constitution, convex profile, long propodeal spines, petiolar node scale- shaped, very broad postpetiole, femora swollen, pilosity scarce with short and blunt hairs, and polimorphic coloration. This species shows a general resemblance with the species of the heterogeneus "*pulchellus*" Baroni Urbani's group. All of these species share some traits like terricolous habits, scarce pilosity composed by short and blunt hairs and scapes and posterior femora not surpassing cephalic and mesosoma length res- pectively. *L. cuyaguateje* does not seem obviously close to any of them in particular, ac- cording to the combination of traits listed in the diagnosis.

Description. Mandibles five toothed. Funiculum with 11 segments, antennal club well differentiated and trhee segmented, scapes slender, not surpassing cephalic length. Me-

sosoma robust, with convex profile, and promesotoraxic suture no deep. Propodeal spines long, almost 30% of mesosoma length, straigth and divergent from base to tips. Petiole long, about 40% of mesosoma length. Petiolar node scale-shaped and high. Postpetiole bell-shaped, broader than long. Gaster relatively big. Femora short, not surpassing mesosoma length and swollen. Tegument slightly shining. Head, mesosoma, petiole and postpetiole punctuated; petiolar node and gaster smooth. Pilosity scarce, composed by short and blunt white erected hairs. Antenns and legs with more abundant hairs, very short and apressed. Coloration variable, dark brown troughout, or opaque yellowish in head and mesosoma, with the remain body areas dark brown.

Distribution. Only known from the type locality.

Etimology. Aborigen voice. It is the name of the largest river in the Pinar del Rio Province.

Comments. The specimens were collected in pine tree forest litter, growing in serpentine soil, very close to the typical "mogotes" hills of the Sierra de los Organos. It is the first known species of Antillean *Leptothorax* associated at this particular habitat.

Leptothorax imias new species
(Fig. 4)

Measurements. Workers (paratypes). SL: 0,53 (0,50-0.53); HW: 0.57 (0.55-0.57). HL: 0.66 (0.62-0.65); ML: 0.90 (0.85-0.90); PL: 0.42 (0.40-0.42); PPW: 0.18 (0.15-0.18); PPL: 0.27 (0.22-0.27); FL: 0.60 (0.55-0.60). Indices. SI: 80.3 (80.3-80.6); CI: 86.4 (86.4-88.7); PI: 46.7 (44.4-46.7); HI: 42.8 (37.5-42.8); PPI: 133.3 (133.3-136.3); FI: 66.7 (64.7-66.7).

Material examined. Holotype; worker, collected by L. F. de Armas in August, 1975, Imias, Santiago de Cuba Province. Paratypes: four workers, one female, same data as holotype.

Diagnosis and comparison. Terricolous species of cuban *Leptothorax* with small size, yellow color, longitudinal profile, propodeal spines short, femora swollen, no hairs on the dorsum of mesosoma and very broad and flattened postpetiole. This species shares the common traits already mentioned above with terricolous Antillean *Leptothorax*. Its affinities are not obvious, and the combination of traits like lacking hairs in the dorsum of mesosoma and a very broad and flattened postpetiole make this species very distinctive among the terricolous group.

Description. Mandibles five toothed. Antennae with 12 segments; club conspicuous and three segmented; scapes slender, not surpassing cephalic length. Head and eyes proportionally big. Mesosoma robust with longitudinal profile. In dorsal view, pronotum with humeral angles rounded; mesosoma width decreasing from pronotum to propodeum. Promesotoraxical suture superficial. Propodeal spines short, about 17% of mesosoma length, straigth and divergent at the tips. Petiolar peduncle short, node high, almost square in profile and rounded in dorsal view. Postpetiole very broad and flattened dorso-

ventrally. Gaster proportionally big, with a well developed sting. Femora swollen and short, posterior femora less than 70% of mesosoma length. Tegument shining; body punctuated throught and very feeble striated. Gaster smooth. Pilosity extremely scarce, with only a few short and blunt white hairs restricted mostly to gaster and clypeus; dorsum of mesosoma with no hairs. Color yellow brown. Mandibles with dentarium border red.

Female. (Fig. 5). Measurements. Sl: 0.60; HW: 0.69; HL: 0.87; ML: 1.29; PL: 0.51; PH: 0.27; PPW: 0.57; PPL: 0.36; FL: 0.72. Indices. SI: 68.9; CI: 79.3; PI: 39.5; HI: 52.9; PPI: 52.6; FI: 55.8.

Description. In comparison with workers, size much bigger, antennal club less conspicuous, eyes very large. Head with three ocelli, mesosoma very robust; petiolar node rounded and massive, postpetiole proportionally small. Tegument, pilosity and coloration like the workers.

Distribution. Only known from the type locality.

Etimology. Named after the type locality.

Comments. The specimens were collected from a very small nest under a stone. Imias is a locality with a very dry climate and xerophitic vegetation.

Leptothorax nipensis new species
(Fig. 6)

Measurements. Workers (paratypes). SL: 1.35 (1.30-1.35); HW: 0.87 (0.84-0.90); HL: 1.26 (1.23-1.29); ML: 1.83 (1.75-1.83); PL: 0.93 (0.90-0.93); PH: 0.30 (0.27-0.30); PPW: 0.36 (0.33-0.36); PPL: 0.45 (0.42-0.45); FL: 1.83 (1.77-1.83). Indices. SI: 107.1 (104.6-107.7); CI: 69.1 (68.3-69.8); PI: 52.6 (51.4-52.6); HI: 32.3 (30.0-32.4); PPI: 80.0 (78.6-80.0); FI: 102.0 (100.0-102.0).

Material examined. Five workers, collected by A. R. Estrada on July 1994, at the limestone cutter Julio Antonio Mella, South of Sierra de Nipe, Santiago de Cuba Province.

Diagnosis and comparison. Limestone-dweller species of Cuban *Leptothorax,* which builts a cartoon tubular entrance to the nest. Body slender with very elongated scapes and legs, femora sligthly swollen, tibiae normal, propodeal spines very long, petiole long with a low and rounded node. Postpetiole longer than broad,. Color brown reddish. This species is relationed to *L. mortoni* from the South of Santiago de Cuba and Guantanamo Provinces and to *L. porphyritis*, from the Habana-Matanzas Heights. It is easily distinguished from *L. mortoni*, because lacks the so distinctive color pattern of the gaster, has more shining tegument, more slender body and appendages and the propodeal spines are more curved in the middle. Both species are alopatric; *L. mortoni* is associated with coastal habitat. It differs from *L. porphyritis* in the more slender body and appendages, better defined longitudinal straited pattern over a densely micropunctuated surface, denser pilosity and tegument less shining.

Description. Mandibles five toothed. Antennae with 12 segments; club little diferentiated; scapes slender, surpassing cephalic length; eyes relaticvely small. Mesosoma with longitudinal profile and slender; pronotum and metanotum broad in comparison with mesonotum, which is relatively constricted. Humeral angles rounded and promesotoraxical suture conspicuous. Propodeal declive very low; propodeal spines long and sharp (36% of mesosoma lentgh); divergent at the base, curved in the middle and straigth at the tips. Petiole very long, more than half the mesosoma length, petiolar node rounded and very low, with no defined faces. Postpetiole longer than broad, slender. Gaster proportionally small, with a well developed sting. Posterio femora length simnilar to mesosoma length, not very swollen; tibiae normal and long. Tegument slightly shining throughout, densely punctuated and feeble but well defined striae. Gaster only with very small punctures. Pilosity dense, white hairs long, and acuminate. Body color dark reddish brown; legs, spines, petiole and postpetiole with ligther tone.

Etimology. Named derived from Sierra de Nipe.

Distribution. Only known from the type locality.

Comments. L. nipensis was observed walking slowly in sunny hours on the surface of limestone walls, quite naked of vegetation and exposed to presumed predators. This behaviour is very similar to the other limestone-dweller species of Cuban *Leptothorax*.

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